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REVIEW

Combatting HIV/AIDS in the Armed Forces: A Literature Review

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Abstract: The Human Immunodeficiency Virus (HIV) and the Acquired Immunodeficiency Syndrome (AIDS) remain significant public health concerns worldwide. This review seeks to present an updated perspective on the spread, consequences, and control measures of HIV/AIDS, focusing on military personnel as a particular at-risk group. It starts by outlining general information about the transmission of the virus and summarizing recent global epidemiological trends. This review further explores the difficulties that HIV/AIDS presents in military settings, including policies regarding the management of service members living with the virus. Additionally, it examines several prevention strategies implemented by militaries around the world, such as educational programs, provision of condoms, and efforts to reduce the stigma associated with the infection.

Keywords: HIV; AIDS; military population; prevention; treatment; management

INTRODUCTION

The Human Immunodeficiency Virus (HIV) was first presented in 1983 as a non-transforming retrovirus [1]. This virus targets CD4+ T lymphocytes and is responsible for Acquired Immunodeficiency Syndrome (AIDS) in individuals with the infection [2]. This condition is characterized by two human lentiviruses: HIV-1 and HIV-2, with transmission occurring exclusively from human to human. Typically, in the absence of a treatment, HIV-1 infection can lead to AIDS, a syndrome associated with significant mortality rates [3]. Both HIV-1 and HIV-2 are RNA viruses that carry the necessary information for the synthesis of the viral proteins essential for the replication and assembly of the virus [4].

HIV transmission occurs either horizontally or vertically [5]. Vertical transmission is the most common way for children to acquire the infection, either in utero, during childbirth, or through breastfeeding [5,6]. Horizontal transmission involves needle sharing or unprotected sexual contact [5,7,8].

One population that has been identified as vulnerable to acquiring HIV infection is military personnel, due to frequently reported high-risk sexual behaviour [9,10] or to their high mobility and exposure to biologically foreign environments [11,12].

Aim

This literature review explores the challenges faced by military populations in the context of HIV/AIDS and presents prevention strategies and proposed solutions for effective prevention and control in this high-risk group.

MATERIALS AND METHODS

This paper examines the medical literature concerning HIV/AIDS, as well as the public information disseminated by state agencies regarding programs and strategies aimed at preventing HIV transmission among military personnel.

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RESULTS

HIV/AIDS: General Overview and Key Statistics

At the end of 2022, the World Health Organization reported that 39 million people were living with HIV, including 1.5 million children. That year, 1.3 million people contracted the virus, reflecting a 38% decline compared to 2010, when 2.1 million new cases were reported [13].

Concerning HIV-related mortality, 2022 saw 630,000 deaths attributed to the virus, down from an estimated 1.3 million deaths in 2010. This represents a 51% decrease over a 13-year period.

In terms of treatment, around 29.8 million people received antiretroviral therapy (ART) in 2022. Among those infected that year, 86% were aware of their HIV status, 76% had begun treatment, and 71% had successfully achieved viral suppression [13].

The African continent remains the most affected globally by HIV, with an estimated 25.6 million individuals living with the virus. Within this group, 90% are aware of their status, 82% receive antiretroviral therapy (ART), and 76% have achieved suppressed viral loads. The region has also seen a significant drop in incidence per 1,000 uninfected individuals. Along with a 56% decrease in AIDS-related deaths since 2010, down to an estimated 380,000 annually [13].

The European Region has an estimated 3 million people living with HIV. Of these, 72% know of their status, 63% are undergoing treatment, and 60% have achieved suppressed viral loads. Roughly 1.9 million individuals are on ART. However, Europe has experienced a rise in HIV incidence over the past decade, from 0.16 to 0.20 per 1,000 uninfected people, alongside approximately 180,000 new infections reported in 2022. AIDS-related mortality has also increased by 37% since 2010, with an estimated 52,000 deaths recorded in 2022 [13].

In Romania, according to the latest data, 716 people were diagnosed with HIV/AIDS in 2023. Over the period from 1985 to 2023, a total of 18,389 individuals have been recorded as having the disease, with 8,556 losing their lives due to HIV-related causes [14].

Epidemiology of HIV in Military Populations

Military populations represent a unique demographic in the global HIV epidemic [11,12], being predominantly composed of young adults [15,16] and often deployed to environments where risk behaviors may increase - factors shown to contribute to new infections among U.S. Army Soldiers [17].

HIV incidence differs substantially across regions, with particularly high rates observed in certain areas of sub-Saharan Africa and Southeast Asia. In the United States, while overall HIV prevalence is lower, military personnel are not exempt. Despite strict screening protocols, they are not exempt [18]. As of March 2021, over 170,000 U.S. service members were deployed globally, marking the largest international military presence at that time[19]. By June 2024, approximately 166,000 active-duty U.S. troops- representing 12.8% of the total force- were still stationed overseas [20].

In 2021, the HIV incidence in active-duty U.S. military was 21 cases per 100,000 service members, slightly higher than that of the general U.S. population, which was approximately 13.9 per 100.000 [21].

Between 1990 and 2024, the Department of Defense conducted over 46 million HIV screening tests, reflecting an extensive and ongoing surveillance effort aimed at early detection and prevention. A total of 1,581 active-duty service members were diagnosed with HIV between January 2017 and June 2022, with 62% remaining on active duty following their diagnosis [22].

These trends are particularly relevant given the global mobility of U.S. forces and their deployment in diverse environments, often under operational stress or during humanitarian missions, which may complicate prevention efforts [23].

In sub-Saharan Africa, HIV/AIDS has disproportionately impacted military personnel compared to civilians. This increased vulnerability is linked to demographic factors- mostly young, sexually active men- and the specific conditions of military service, such as extended time away from home, deployment to unstable regions, and social dynamics that encourage risky sexual behavior [15,16,24].

In 2014, Lloyd et al. reported that the prevalence of HIV among military men from sub-Saharan Africa and other low-income settings was notably higher compared with civilian men of reproductive age, and even higher among longer-serving service members [25]. In 2024, Grillo et. al revealed that military members were frequently involved in dense HIV transmission networks, alongside the civilian population and female sex workers [26].

The Perspective on HIV/AIDS in the Romanian Army

Military personnel infected with HIV but without any functional deficiency (e.g., those who are asymptomatic, experiencing acute retroviral syndrome, or presenting with generalized persistent lymphadenopathy) or who have only low functional impairment (e.g., clinical manifestations due to HIV infection; constitutional symptoms; herpes zoster; idiopathic thrombocytopenic purpura; or peripheral neuropathy) are not classified as having a disability and are allowed to continue performing their military duties [27].

Risk Factors for HIV in the Military

Military populations are considered to be at an elevated risk for acquiring HIV infection [12] due to exposure to a multitude of risk factors. The composition of military forces- mostly young, sexually active males- places them in a higher-risk demographic compared to the general population [25]. Frequent deployments that often result in extended separation from stable partners may further increase the tendency to engage in unsafe sexual practices [28]. The mobility of military troops and exposure of personnel to high-prevalence settings also contribute to this risk [11, 26].

Sexual risk behavior is an essential driver of transmission. In 2015, Hakre et al. reported that among HIV seroconverters in the U.S. Army between 2012 and 2014, most reported multiple sexual partners, inconsistent condom usage, and casual sexual contact or anonymous partners in the year before diagnosis [10].

A culture of masculinity and peer pressure has been reported to contribute to the encouragement of sexual risk-taking behaviors among military personnel [29], influencing HIV-related practices and increasing vulnerability to infection [30].

Tran et al. reported in 2019 that in the Armed Forces of the Republic of the Congo, alcohol consumption, commonly reported among active-duty soldiers, has also been shown to encourage risky sexual habits such as a reduction in condom usage; an increase in transactional sex and multiple sexual partners compared to the lower risk peers [31]. Similar patterns were reported on by Harbertson et al. in 2019, in the U.S. Marine Corps, where a reduction of condom use was associated with alcohol abuse or drug use to enhance sexual experiences [32].

Institutional barriers that may delay diagnosis, prevention, and linkage to healthcare within the military population include concerns over confidentiality and fear of stigma or professional consequences [33], furthering a decrease to essential social and medical care, such as ART [34].

HIV Prevention Strategies and Program Implementation in Military Settings

HIV epidemiology and prognosis have improved substantially due to the universal use of ART, the availability of medications that are more effective and better tolerated by patients [35], and the introduction of preventive measures such as pre-exposure prophylaxis (PrEP) [36]. With a timely diagnosis followed by early initiation of ART, the life expectancy of individuals living with HIV has significantly increased [37, 38].

The Department of Defense (DoD) in the United States of America offers the TRICARE program as part of its efforts to reduce the spread of HIV. This program includes a range of services aimed at both HIV prevention and care. Key initiatives include coverage for pre-exposure prophylaxis (PrEP), as well as promoting access to treatment options such as ART. Additionally, TRICARE provides counseling and support services, and it covers HIV testing for beneficiaries identified as being at risk for contracting the infection [23, 39].

Nonetheless, public health initiatives still encounter obstacles. Misconceptions about HIV transmission are prevalent among people of reproductive age in developing countries and represent a barrier to effective prevention efforts [40,41]. Promoting medical education and raising awareness around HIV-related stigma may have a positive impact on lowering risky sexual behaviors, particularly among military populations [42, 43].

The Department of Defense HIV/AIDS (DHAPP) of the United States of America implements an extensive HIV/AIDS prevention program with various strategies and interventions. These include index case HIV testing, periodic updates to military HIV policies, promotion of condoms, and facilitating access to them. DHAPP also conducts training to prevent stigma and discrimination related to HIV/AIDS [44].

In 2011, Singh and Banerjee conducted a survey among regimental officers regarding hiv prevention in the armed forces and found that there were difficulties in program implementation, especially in the promotion of condom use [45]. In 2015, Tran et al. reported that distributing free condoms to military personnel with improved packaging and a more pleasant scent led to an increase in usage among servicemembers, thereby enhancing efforts to prevent sexually transmitted infections within the military community [46].

Anastario et al. conducted in 2012 a pilot study in a military unit in Barbados, where a modified version of the Popular Opinion Leaders (POL) intervention was used. This intervention involved selecting and training Popular Opinion Leaders within the military personnel to promote conversations on condom use. As a result, there was a noticeable rise in condom use among military personnel after the intervention [47].

CONCLUSION

HIV/AIDS continues to pose a serious health challenge on a global scale, even as progress has been made in recent years. The prevalence of the disease remains a significant social and public health concern, with millions of individuals affected worldwide.

In military settings, targeted prevention strategies are particularly important due to the specific occupational and behavioral risks associated with service. Various armed forces have adopted structured programs aimed at limiting transmission, supporting personnel living with HIV/AIDS, and addressing stigma within military environments.

By focusing on education, encouraging risk-reduction behaviors, and ensuring access to services such as PrEP and ART, military institutions play a key role in HIV control. Sustained implementation of these measures can help transition HIV/AIDS from a widespread public health threat to a manageable chronic condition.

Conflicts of interest and sources of funding

The authors declare no conflict of interest. No artificial intelligence automatically generated text was inserted in this manuscript, and no image was previously published in another journal or is under consideration for publication elsewhere. This research received no external funding.

Authors' contribution

All authors have read and agreed to the published version of the manuscript

Ethics approval and consent to participate

Not applicable.

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